

REMARKS/ARGUMENTS

Reconsideration of the above-identified application in view of the present amendment is respectfully requested. Claims 33-36 are added and claim 25 is amended. Claims 1-8, 12-21, and 24-36 are pending.

Claims 1-4, 13-15, 20-21, 26, and 29-32 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2004/0114662 to Messler ("Messler") which corresponds to PCT Publication No. WO 02/090953. Withdrawal of this rejection is respectfully requested for at least the following reasons.

First, the publication date of Messler is June 17, 2004, which is after the filing date of January 29, 2004 for applicant's application. Thus, the publication date of Messler is clearly not more than one year prior to the date of applicant's application. Therefore, the rejection of claims 1-4, 13-15, 20-21, 26, and 29-32 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2004/0114662 to Messler should be withdrawn.

Further, Messler does not disclose or suggest obtaining a thermal image as the weld is being formed, by collecting infrared radiation passing through a second piece of material from the weld and the pool of material, as recited in claims 1 and 13. By contrast, Messler discloses using a pyrometer 58 to detect the thermal radiation 60 emitted by the pool of material or weld 47. This is used to regulate the melt temperature (see paragraph [0036]). Messler also teaches that the pyrometer 58 can be integrated with the source of the laser light 20 in a feedback control system. The thermal radiation emitted by the weld 47 is detected by the pyrometer 58 and analyzed in the connected devices. In the event of deviations from a desired

reference value, the result of the analysis is used to regulate the intensity of the laser light 20 (see paragraph [0037]). However, this method in which the pyrometer 58 is used does not obtain a thermal image as the weld is being formed. Furthermore, the pyrometer 58 does not detect thermal radiation from the solidified weld seam 15. Accordingly, the pyrometer 58 does not collect infrared radiation from the weld 15 and the pool of material 47.

Messler also discloses two different measures for analyzing radiations from the weld. However, these measures analyze radiations from the already solidified, finished weld seam (see paragraphs [0010] and [0012]). In particular, Messler states that one measure uses an independent laser radiation 20 as the inspection radiation (see paragraphs [0011], [0026], and claim 2) and the other measure uses the laser radiation used to produce the weld seam as the inspection radiation (see paragraphs [0012], [0034], and claim 3). Messler discloses that for both measures during the measurement of the exit radiation, only the reflected radiation 33', 53 from an already solidified 49 point of the weld seam 15 that has been produced is detected and supplied to an evaluation unit (37) (see lines 8-12 from page 5 of claim 1).

Paragraph [0011] of Messler, which paragraph is cited by the Examiner, only discloses that these two measures can then be used not only during the welding operation itself, but also later on the finished welded product. Messler does not disclose that these measures are used to obtain a thermal image as the weld is being formed by collecting radiation passing through a second piece of material from the weld and the pool of material.

Moreover, Messler fails to disclose or suggest that these measures obtain a thermal image as the weld is being formed, as recited in claims 1 and 13. The

Examiner admits this too, but argues that this is inherent in the device of Messler.

This is not correct.

Under the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to include the missing element if the missing element is "necessarily present" in the item described in the reference.

Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268 (Fed. Cir. 1991).

"Necessarily present" for inherency means more than merely probably or possibly present. Trintec Industries, Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1295 (Fed. Cir. 2002).

Obtaining a thermal image is not "necessarily present" in the device of Messler. For the method of inspection depicted in Fig. 2, Messler merely discloses that the device 38 is a monitor, whose screen displays the quality of the weld seam that has been produced in the workpiece 10 (see paragraph [0027]). For the method of inspection shown in Fig. 5, Messler discloses that radiation is detected by a CCD camera 39, which receives an image of the weld seam 15. The image is analyzed in the associated evaluation unit 37 by image processing software. A suitably intensified and enlarged image 41 of the weld seam previously produced in the workpiece then appears on the display device 38 (see paragraph [0032]). The image 41 of the weld seam 15 in Messler could be many possibilities that are indicative of the quality of the weld seam 15.

In fact as previously mentioned, Messler discloses using a pyrometer 58 to detect the thermal radiation 60 emitted by the weld in order to regulate the melt temperature and also to regulate the intensity of the laser light 20 in a feedback control system. This is more evidence that the devices 38, 39 of Messler do not

obtain a thermal image of the weld being formed, because if the devices of Messler could obtain a thermal image, then a pyrometer would not be needed. Therefore, it is not inherent that the device of Messler obtains a thermal image of a weld being formed.

Therefore, in view of the above-mentioned reasons, claims 1 and 13 are allowable. Claims 2-4, 22, 23, 25, and 29-32 depend directly or indirectly from claim 1 and are therefore allowable as depending from an allowable claim and for their specific features recited therein.

In addition to the above-mentioned reasons, claim 13 should be allowed for the recited feature of heating first and second plastic pieces at their location of abutment by directing the laser beam over the path of a weld pool multiple times. Messler does not disclose or suggest this feature. The Examiner admits this too, but argues that this is inherent, "that the weld should be heated by the laser beam a plurality of times in order to create a weld having a desired length". This is not correct.

First, claim 13 does not recite that the weld is heated by the laser beam a plurality of times at a plurality points in order to create a weld having a desired length. Rather, claim 13 specifically recites directing the laser beam over the path of a weld pool multiple times.

Further, this feature of claim 13 is not "necessarily present" in Messler. In fact, Messler specifically teaches **not** directing the laser beam over the path of a weld pool multiple times. In particular, Messler specifically discloses that for the first method of Fig. 2, a laser beam 20 strikes two movable beam-deflecting mirrors 23, 24, which direct the laser beam to the workpiece 10 through a theta objective 35 and

can produce the weld seam 15 by simultaneous welding (see paragraph [0024]). Messler specifically discloses that for the method of Fig. 6, the laser beam 20 that enters a processing head 50 and is collimated by a lens 45. The beam then passes through two mirrors 43, 44 and is bundled by a collimator 46 and focused on a well-defined area 47 of the workpiece 10 (see paragraph [0033]). A melt 48 of both materials 18, 19 forms in the area of the focus 47. During movement of the workpiece 10 relative to the processing head 50, the focus moves along the workpiece, and the melt gradually undergoes solidification 49. The weld seam 15 forms in this way. (See beginning of paragraph [0034]).

Thus, the laser beam is directed over the path, where the weld seam is formed, only once and not multiple times. Thus, it is not inherent that Messler directs the laser beam over the path of a weld pool multiple times. Therefore, in view of the above-mentioned reasons, claim 13 is allowable. Claims 14-21 and 24, which depend directly or indirectly from claim 13, are allowable as depending from an allowable claim and also for the specific limitations recited therein.

Claim 25 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Messler in view of U.S. Patent No. 6,201,211 to Emmelmann ("Emmelmann"). Withdrawal of this rejection is respectfully requested for at least the following reasons. Claim 25, which depends from claim 1, should be allowed for the same reasons as claim 1 and also for the additional feature recited therein. Claim 25 is amended to substitute "directing" for "moving" to be consistent with claim 1, which also uses the term "directing" with respect to the laser beam. Claim 25 patentably defines over the cited references.

35 U.S.C. § 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” In making a determination of obviousness under 35 U.S.C. §103(a):

...the scope and contents of the prior art are determined; the differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. Graham v. John Deere, 383 U.S. 1, 17-18, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966).

Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, *there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.* KSR Int’l Co. v. Teleflex Inc., 127 S. Ct. 1727; 2007 U.S. Lexis 4745, 36-37; 75 U.S.L.W. 4289; 82 U.S.P.Q.2d 1385 (2007) (emphasis added). Also, the U.S. Supreme Court in KSR Int’l. Co. V. Teleflex, Inc. noted that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the manner claimed.” KSR, slip Op. at 14, 15.

There is no reason that would have prompted a person of ordinary skill in the relevant field to modify Messler in view of Emmelmann in the manner claimed in claim 25. The Office Action states that it would be obvious to modify the device, disclosed by Messler, “so as to have a movable laser welding beam, as taught by

Emmelmann, in order to properly focus the laser beam over the weld, as already suggested by Emmelmann, in order to adjust the distance and thus, the laser energy/heat delivered to the weld

However, this is not a reason that would have prompted a person of ordinary skill in the relevant field to modify Messler in view of Emmelmann in the manner claimed in claim 25. Claim 25 specifically recites directing the laser beam over the path of a weld pool multiple times. The alleged reason that the Examiner offers is only related to moving the laser beam up and down for properly focusing the laser beam over the path. This alleged reason is not related to directing the laser beam over the path multiple times (as opposed to forming the weld a portion at a time).

For the reasons set forth above, the rejection of claim 25 as being unpatentable over Messler in view of Emmelmann under 35 U.S.C. 103(a) fails to establish a prima facie case for obviousness. Therefore, claim 25 is allowable. Claim 27, which depends from claim 27, should be allowed for the same reasons as claim 25 and also for the specific feature recited therein.

New claim 33, which depends from claim 1, should be allowed for the same reasons as claim 1 and also for the additional feature recited therein. Claim 33 recites that the method includes the steps of, simultaneous with said heating step, continuously obtaining a plurality of thermal images as the weld is being formed by collecting infrared radiation passing through the second piece of material from the weld and the pool of material, each of said thermal images including, in its entirety, a weld pool that results in the weld; analyzing the obtained thermal image for characteristics indicative of an acceptable weld being formed; determining that weld is formed; and stopping the obtaining of any thermal image of the weld after the weld

is formed. None of the cited references disclose or suggest this feature. Therefore, claim 33 is allowable.

New claim 34, which depends from claim 13, should be allowed for the same reasons as claim 13 and also for the additional feature recited therein. Claim 34 recites that the method includes the steps of, simultaneous with said heating step, continuously obtaining a plurality of thermal images as the weld is being formed by collecting infrared radiation passing through the second piece of material from the weld and the pool of material, each of said thermal images including, in its entirety, a weld pool that results in the weld; analyzing the obtained thermal image for characteristics indicative of an acceptable weld being formed; determining that weld is formed; and stopping the obtaining of any thermal image of the weld after the weld is formed. None of the cited references disclose or suggest this feature. Therefore, claim 34 is allowable.

New claim 35, which depends from claim 25, should be allowed for the same reasons as claim 25 and also for the additional feature recited therein. Claim 35 recites that the path is a closed-curved shape, and wherein the step of heating the first and second pieces at their location of abutment to form a pool of material at the location of abutment which pool of material forms a weld between the pieces is performed by directing the laser beam around the path of the weld pool multiple times; and the modifying occurs during directing of the laser beam around the path during at least one of the multiple times. None of the cited references disclose or suggest this feature. Therefore, claim 35 is allowable.

Claim 36, which depends from claim 13, should be allowed for the same reasons as claim 13 and also for the feature recited therein. Claim 36 recites that

the path is a closed-curved shape, and wherein the step of heating the first and second plastic pieces at their location of abutment is performed by directing the laser beam around the path of a weld pool multiple times to form a pool of material at their location of abutment which pool of material forms a weld between the pieces. None of the cited references disclose or suggest this feature. Therefore, claim 36 is allowable.

In view of the foregoing, it is respectfully requested that the amendment be entered and the application allowed.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,


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